

## Technical Data

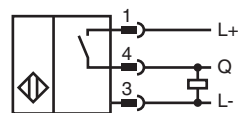
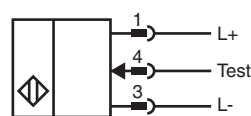
|                                             |                |                                                                                                                                                   |
|---------------------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Threshold detection range                   |                | 1.5 m                                                                                                                                             |
| Light source                                |                | laser diode                                                                                                                                       |
| Light type                                  |                | modulated visible red light , 680 nm                                                                                                              |
| Laser nominal ratings                       |                |                                                                                                                                                   |
| Note                                        |                | LASER LIGHT , DO NOT STARE INTO BEAM                                                                                                              |
| Laser class                                 |                | 1                                                                                                                                                 |
| Wave length                                 |                | 680 nm                                                                                                                                            |
| Beam divergence                             |                | > 5 mrad                                                                                                                                          |
| Pulse length                                |                | approx. 2 µs                                                                                                                                      |
| Repetition rate                             |                | approx. 16.6 kHz                                                                                                                                  |
| max. pulse energy                           |                | 9.5 nJ                                                                                                                                            |
| Diameter of the light spot                  |                | approx. 3 mm at a distance of 1000 mm                                                                                                             |
| Opening angle                               |                | approx. 0.5 °                                                                                                                                     |
| Optical face                                |                | frontal                                                                                                                                           |
| Ambient light limit                         |                | EN 60947-5-2 : 30000 Lux                                                                                                                          |
| <b>Functional safety related parameters</b> |                |                                                                                                                                                   |
| MTTF <sub>d</sub>                           |                | 806 a                                                                                                                                             |
| Mission Time (T <sub>M</sub> )              |                | 20 a                                                                                                                                              |
| Diagnostic Coverage (DC)                    |                | 0 %                                                                                                                                               |
| <b>Indicators/operating means</b>           |                |                                                                                                                                                   |
| Operation indicator                         |                | LED green, statically lit Power on , short-circuit : LED green flashing (approx. 4 Hz)                                                            |
| Function indicator                          |                | Receiver: LED yellow, lights up when light beam is free, flashes when falling short of the operating reserve ; OFF when light beam is interrupted |
| <b>Electrical specifications</b>            |                |                                                                                                                                                   |
| Operating voltage                           | U <sub>B</sub> | 12 ... 24 V                                                                                                                                       |
| No-load supply current                      | I <sub>0</sub> | Emitter: ≤ 10 mA<br>Receiver: ≤ 8 mA                                                                                                              |
| Protection class                            |                | III                                                                                                                                               |
| <b>Input</b>                                |                |                                                                                                                                                   |
| Test input                                  |                | Test of switching function at 0 V                                                                                                                 |
| <b>Output</b>                               |                |                                                                                                                                                   |
| Switching type                              |                | NO contact / dark on                                                                                                                              |
| Signal output                               |                | 1 PNP output, short-circuit protected, reverse polarity protected, open collector                                                                 |
| Switching voltage                           |                | max. 30 V DC                                                                                                                                      |
| Switching current                           |                | max. 50 mA , resistive load                                                                                                                       |
| Voltage drop                                | U <sub>d</sub> | ≤ 1.5 V DC                                                                                                                                        |
| Switching frequency                         | f              | approx. 2 kHz                                                                                                                                     |
| Response time                               |                | 250 µs                                                                                                                                            |
| <b>Conformity</b>                           |                |                                                                                                                                                   |
| Product standard                            |                | EN 60947-5-2                                                                                                                                      |
| Laser safety                                |                | EN 60825-1:2007                                                                                                                                   |
| <b>Approvals and certificates</b>           |                |                                                                                                                                                   |
| UL approval                                 |                | E87056 , cULus Recognized, Class 2 Power Source                                                                                                   |
| CCC approval                                |                | CCC approval / marking not required for products rated ≤36 V                                                                                      |
| FDA approval                                |                | IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007              |
| <b>Ambient conditions</b>                   |                |                                                                                                                                                   |
| Ambient temperature                         |                | -20 ... 60 °C (-4 ... 140 °F)                                                                                                                     |
| Storage temperature                         |                | -30 ... 70 °C (-22 ... 158 °F)                                                                                                                    |
| <b>Mechanical specifications</b>            |                |                                                                                                                                                   |
| Housing width                               |                | 7.5 mm                                                                                                                                            |
| Housing height                              |                | 24 mm                                                                                                                                             |
| Housing depth                               |                | 11.2 mm                                                                                                                                           |
| Degree of protection                        |                | IP67                                                                                                                                              |

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Technical Data

|              |                                                                 |
|--------------|-----------------------------------------------------------------|
| Connection   | 200 mm fixed cable with 3-pin, M8 x 1 connector                 |
| Material     |                                                                 |
| Housing      | PC/ABS and TPU                                                  |
| Optical face | PC                                                              |
| Cable        | PUR                                                             |
| Installation | Fixing screws , 2 x M2 allen head screws included with delivery |
| Mass         | approx. 10 g per sensor                                         |
| Cable length | 200 mm                                                          |

Connection



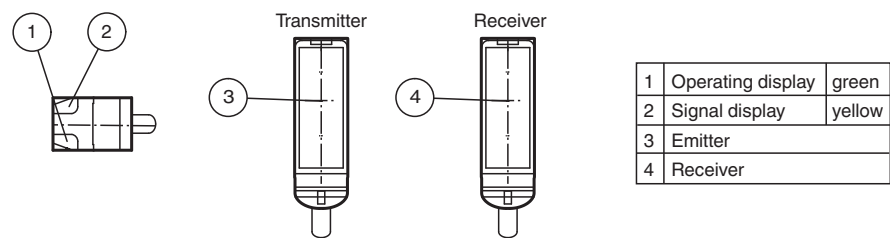
Connection Assignment



Wire colors in accordance with EN 60947-5-2

|   |    |         |
|---|----|---------|
| 1 | BN | (brown) |
| 3 | BU | (blue)  |
| 4 | BK | (black) |

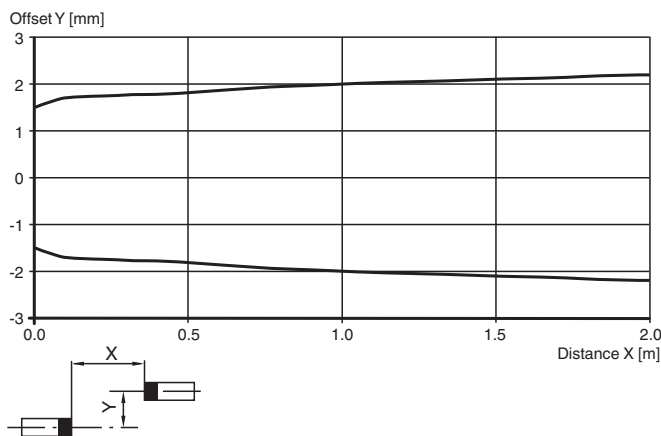
Assembly



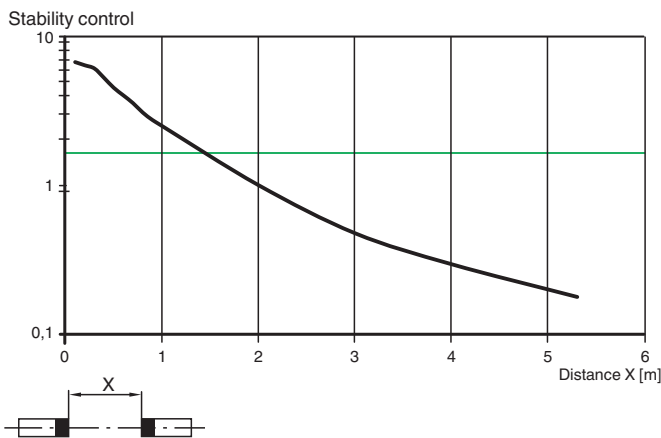
|   |                   |        |
|---|-------------------|--------|
| 1 | Operating display | green  |
| 2 | Signal display    | yellow |
| 3 | Emitter           |        |
| 4 | Receiver          |        |

Characteristic Curve

Characteristic response curve lateral movement



Relative received light strength



Safety Information



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## Safety Information

### Laser Class 1 Information

The irradiation can lead to irritation especially in a dark environment. Do not point at people!

Maintenance and repairs should only be carried out by authorized service personnel!

Attach the device so that the warning is clearly visible and readable.

The warning accompanies the device and should be attached in immediate proximity to the device.

Caution – Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

## Accessories

|                                                                                   |                     |                                                                      |
|-----------------------------------------------------------------------------------|---------------------|----------------------------------------------------------------------|
|  | <b>V3-WM-2M-PUR</b> | Female cordset single-ended M8 angled A-coded, 3-pin, PUR cable grey |
|  | <b>MH-R2-01</b>     | Mounting aid for R2 series, Mounting bracket                         |
|  | <b>MH-R2-02</b>     | Mounting aid for R2 series, Mounting bracket                         |
|  | <b>MH-R2-03</b>     | Mounting aid for R2 series, Mounting bracket                         |
|  | <b>MH-R2-04</b>     | Mounting aid for R2 series, Mounting bracket                         |